

EXHIBIT 8

DECLARATION OF DAVID A. TIRRELL

I, David A. Tirrell, declare as follows:

1. I am the provost at the California Institute of Technology (Caltech) in Pasadena, CA. I have held that position since October 1, 2017. I have held an appointment as Professor of Chemistry and Chemical Engineering at Caltech since July 1, 1998. I previously held professorial appointments at Carnegie Mellon University and at the University of Massachusetts at Amherst.

2. I have personal knowledge of the contents of this declaration, or have knowledge of the matters based on my review of information and records gathered by Caltech personnel, and could testify thereto.

3. Caltech receives substantial annual funding from the National Science Foundation (“NSF”). In fiscal year 2024, we expended \$93,411,998 in conducting research supported by NSF. Of this total, \$71,709,654 were expended as direct costs, \$21,702,344 as indirect costs. We have 210 active NSF awards and subawards.

4. Caltech intends to apply for new funding awards, and/or renewals and continuations of existing funding awards, in the next year and in future years.

5. The funding Caltech receives from NSF supports critical and cutting-edge research vital to our nation’s security, commercial technology, and high-quality American jobs. Millions of Americans will benefit from this research. For example:

- a. Caltech research in quantum science and technology is developing new materials for quantum devices, new algorithms for quantum computing, and new strategies for quantum error correction – the central challenge in engineering a practical quantum computer.

- b. Caltech is the lead institution in the operation of the Laser Interferometer Gravitational Wave Observatory (LIGO), a joint effort with the Massachusetts Institute of Technology, supported by NSF at a level of \$250,000,000 during the current five-year award period. In 2015, LIGO was responsible for the first observation of gravitational waves, an extraordinary discovery that confirmed a prediction made by Albert Einstein 100 years earlier and that opened a new window into the nature of the universe. This discovery, recognized by the Nobel Prize in Physics in 2016, was based on more than 35 years of sustained support of LIGO by NSF.
- c. Caltech chemists and chemical engineers are developing new methods of molecular synthesis that are essential to the continued success of the American pharmaceutical industry, new enzymes capable of catalyzing unprecedented molecular transformations (work honored by the 2018 Nobel Prize in Chemistry), and new concepts in battery technology that are needed to secure the nation's energy future.

6. Reimbursement of Caltech's indirect costs is essential for supporting this research. NSF's proposal to cut indirect cost rates to 15% would end or seriously jeopardize all of the research projects described in paragraph 5, all of which are planned for renewal at the end of their current funding periods.

7. Indirect costs include those incurred in the construction and maintenance of state-of-the-art facilities for advanced research, as well as the procurement and maintenance of the equipment necessary to conduct such research. Without this critical infrastructure, we simply cannot conduct the research.

8. For example, with respect to the areas of research described in Paragraph 5:
 - a. To ensure that NSF-supported research in quantum science and technology is conducted at the highest level, Caltech is building the 70,000 square foot Ginsburg Center for Quantum Precision Measurement, scheduled for completion in 2026. Construction of the Ginsburg Center – at a cost of approximately \$140,000,000 – is funded by generous private gifts to Caltech. Ginsburg will be the home of the NSF-supported Institute for Quantum Information and Matter (IQIM). Indirect cost recovery will be essential to proper maintenance and operation of the Ginsburg Center and to the continued success of IQIM. Without adequate indirect cost recovery, it will be impossible to equip the Center properly with the specialized instrumentation needed for research in quantum science and technology, and building systems will fall into disrepair.
 - b. The Ginsburg Center also will host the LIGO effort on the Caltech campus. Exploitation of quantum phenomena is critical to the extraordinary sensitivity of the LIGO observatories, which can detect displacements smaller than 1/10,000 the diameter of an atomic nucleus. American leadership in gravitational wave physics will be impossible – and hundreds of millions of NSF dollars will be jeopardized – if the indirect costs provided by NSF are insufficient to maintain the state-of-the-art laboratories in the Ginsburg Center.
 - c. In October 2024, Caltech opened its new Resnick Sustainability Center, a 75,000 square foot building with state-of-the-art laboratories for chemistry, chemical engineering, bioengineering, applied physics and space science.

Construction – which cost \$154,000,000 – was funded entirely by private philanthropy, and represents another investment by Caltech in providing the infrastructure needed for high-quality NSF-supported research. In particular, Resnick is being outfitted with an extraordinary suite of analytical instrumentation needed for the synthetic chemistry, enzyme engineering, and battery studies described in Paragraph 5c. Without adequate indirect cost recovery, the Resnick Center and its instrumentation cannot sustain the high-quality research needed to ensure the continued success of American science and industry.

9. Physical facilities costs are among the largest components of indirect costs. This includes not only the usual costs of constructing and maintaining buildings where research occurs, but the very high costs of outfitting and maintaining specialized laboratory space, which can require special security, advanced HVAC systems, and specialized plumbing, electrical systems and waste management, as well as specialized laboratory equipment. The quality and amount of space available to researchers have a direct and profound impact on the nature and amount of research that can be done at Caltech. In the Ginsburg and Resnick Centers alone, Caltech has invested nearly \$300,000,000 in private funds to leverage federal research dollars for maximum impact. Without adequate indirect cost recovery, these research centers will never reach their full potential, and returns to the American people will be irretrievably lost.

10. In addition, indirect costs fund the administration of awards, including staff who ensure compliance with a vast number of regulatory mandates from agencies such as NSF. These mandates serve many important functions, including ensuring research integrity; protecting research subjects; properly managing and disposing of chemical and biological agents and other

materials used in research; managing specialized procurement and security requirements for sensitive research; managing funds; preventing technologies and other sensitive national security information from being inappropriately accessed by foreign adversaries; providing the high level of cybersecurity, data storage, and computing environments mandated for regulated data; ensuring compliance with specialized security protocols and safety standards; maintaining facility accreditation and equipment calibration to meet research quality and security standards; and preventing financial conflicts of interest.

11. Recovery of Caltech's indirect costs is based on predetermined rates that have been contractually negotiated with the federal government.

12. In fiscal year 2024, the predetermined indirect cost rate corresponded to approximately 30% of total costs. The amount of indirect cost recovered during the year reflects rates negotiated over several years, owing to the multi-year character of federal awards.

13. The effects of a reduction in the indirect cost rate to 15% of modified total direct costs would be devastating. Of the \$93,411,998 in NSF funding that Caltech expended in fiscal year 2024, \$71,709,654 consisted of payment of direct costs, and \$21,702,344 consisted of reimbursement of indirect costs. We expect our expenditures and indirect cost recovery in fiscal year 2025 and subsequent years to be similar.

14. If—contrary to what Caltech has negotiated with the federal government—the indirect cost rate was reduced to 15% of modified total direct costs for new awards, that would reduce Caltech's anticipated annual indirect cost recovery by approximately \$14,800,000, to \$6,900,000.

15. This reduction would have deeply damaging effects on Caltech's ability to conduct research from day one. For example:

- a. We would immediately begin a process of reducing the number of graduate student researchers at Caltech. An estimate of the extent of reduction points to a loss of 250 positions over the first year, with no prospect of new appointments to fill those positions. This would significantly hamper our ability to continue critical research projects, and jeopardize our ability to contribute to the nation's technological success. Similar reductions in the number of postdoctoral researchers and technical support staff would be implemented.
- b. Hiring of new faculty members would be curtailed, slowing the development of the workforce that will be essential if the United States is to succeed in international competitions in national security, quantum computing, energy technology, manufacturing, and artificial intelligence. Even if funding were later restored, it would be difficult to find qualified scientists and engineers to fill these positions. Top scientists will not move to (or stay at) Caltech if we cannot provide the facilities necessary to conduct world-class research.

16. Caltech currently has approximately 80 research proposals pending at NSF. All of the proposed projects have been planned, budgeted and submitted on the basis of our negotiated rate of indirect cost recovery. The total funds requested in the pending proposals amount to roughly \$50,000,000. Many of the proposed projects will not be feasible if the indirect cost rate is reduced to 15% of modified total direct costs, and the impact on the Caltech research enterprise will be crippling.

17. Caltech has for decades relied on the payment of indirect costs. Until now, we have been able to rely on the well-established process for negotiating indirect cost rates with the government to inform our budgeting and planning. Operating budgets rely on an estimate of both

direct and indirect sponsored funding to plan for annual staffing needs (*e.g.*, post-docs, PhD students, and other research staff), infrastructure support (*e.g.*, IT networks, regulatory compliance, and grant management support), and facility and equipment purchases. Furthermore, Caltech has long-term obligations—for example, five-year commitments to graduate students for payment of salaries, support of tenured faculty members, and financing of building construction—and it relies on budgeted grant funding, including associated indirect cost recovery, to fulfill these commitments. This multi-year budgeting process also assumes the availability or possibility of grant renewals under roughly similar terms – and certainly at the negotiated indirect cost rate – as had been previously available.

18. In addition to the immediate effects and reliance interests described above, dramatically cutting indirect cost reimbursement would have longer-term effects that are both cumulative and cascading. Perhaps most harmful is the contraction in Caltech’s ability to train the scientists and engineers of the future, which will compound from year to year if the proposed reduction in indirect cost recovery is implemented.

19. Disruptions to Caltech’s research will also have negative effects in the Pasadena area, the state of California, and the broader region. Approximately 6000 California residents are directly employed by Caltech—and we collaborate with state and local partners to help solve regional challenges through joint research and innovation. Caltech research also fuels spending in the regional economy, including by driving discoveries that launch new ventures, attract private investment, and make a positive social impact. Caltech spins off 10-12 new companies nearly every year. A substantial reduction in Caltech’s research budget would immediately and seriously jeopardize these contributions to the local region. For example, Caltech research in quantum science and technology has seeded a major collaboration with Amazon Web Services (AWS) that

employs more than 100 scientists and engineers in a new building constructed by AWS on the Caltech campus to house an ambitious Center for Quantum Computing. In collaboration with a major real estate development firm, Caltech is planning a 120,000 square foot innovation center to be constructed two blocks north of campus. Prospective tenants include Caltech partners in energy research, biotechnology, and quantum science and technology. Development of the innovation center faces profound risk if federal research support at Caltech is reduced. The economic impact of Caltech's NSF-supported research extends far beyond the Pasadena area; LIGO employs more than 50 research staff in Livingston, Louisiana, and nearly 50 in Hanford, Washington.

20. Finally, slowdowns or halts in research by Caltech and other American universities will allow competitor nations that are maintaining their investments in research to surpass the United States in energy technologies, cybersecurity, quantum computing, biotechnology, pharmaceuticals, manufacturing technology and artificial intelligence, threatening both our nation's security and its economic dominance.

21. Caltech cannot cover the funding gap itself. While Caltech maintains an endowment, it is neither feasible nor sustainable for Caltech to use endowment funds or other revenue sources to offset shortfalls in indirect cost recovery:

- a. The majority of Caltech's endowment is restricted to specific donor-designated purposes, such as scholarships, faculty chairs, and academic programs. Caltech is not legally permitted to use those funds to cover research infrastructure costs.
- b. Even the portion of the endowment that is unrestricted is subject to a carefully managed annual payout, typically around 5%, to ensure long-term financial stability for the institution.

22. It is also not feasible or sustainable for Caltech to use other revenue sources to offset shortfalls in indirect cost recovery. As a non-profit institution, Caltech applies all of its revenue to mission-critical activities, leaving little margin to absorb unexpected funding gaps. Unlike for-profit organizations, Caltech does not generate significant surpluses that could be redirected without impacting core academic priorities such as educational programs and financial aid support for students. Absorbing the cost of a lower indirect cost rate, even if it were possible, would create long-term budget pressures on Caltech—which would in turn force reductions in key investments supporting Caltech’s faculty, students, staff, research, and teaching infrastructure, as well as other critical activities needed to maintain Caltech’s academic excellence. So even if Caltech could “cover” some of the indirect costs previously funded by NSF, it could do so only by negatively affecting other critical goals central to the institution’s mission.

23. If Caltech can no longer apply for NSF grants because it is unable to accept the new indirect cost rate cap, the harms described herein would be exacerbated. The loss in funding from NSF would mean that draconian cost-cutting measures would need to be adopted. The process of identifying these measures would need to begin immediately, and layoffs, closures, and research pauses or contractions would follow soon thereafter. Cutting back on Caltech’s research in fields such as energy technology, quantum science and technology, biotechnology, computer science, and artificial intelligence will have devastating long-term implications for national security, the economy, and high-quality American jobs.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 3, 2025, at Pasadena, CA.



David A. Tirrell